

Build a better coffee cup; Is Canada ready for the ButterflyCup? Fast-food restaurants in Europe and Asia have embraced it. Now Toronto coffee drinkers can sample it, as A&W Canada introduces the newest entry in the quest for the perfect takeaway cup

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Body

Nearly a decade ago, while researching the catastrophic environmental damage brought about by plastic waste, Joe Lu set out to fix one scourge in particular: the to-go coffee cup.

Some five billion of them get tossed into Canadian trash bins every year, clogging landfills and contributing in no small part to the global accumulation of waste. They masquerade as benign paper cups, seemingly ephemeral, but are covered in a thin plastic lining that takes two decades to fully decompose.

Lu, a mechanical engineer from Shanghai, wanted to find an alternative. The cup he came up with - the ButterflyCup - is made entirely from biodegradable paper: no plastic coating, no plastic lid. It's now being used at fast-food restaurants in Europe and East Asia. Most recently, it was adopted by A&W Canada, which plans to pilot the product in Toronto this month.

"When it comes to design, some people just have it and others don't," said Tommy McLoughlin, CEO and co-founder (with Lu) of Dublin-based ButterflyCup. The two met in 2009, founded a startup, and spent the next decade bringing the ButterflyCup to life. "It was pretty clear when we met that Joe definitely has it."

Big-name food chains have spent decades struggling to find the perfect sustainable solution to their eco-unfriendly single-use cups. Facing immense public pressure to reduce waste, they've experimented with compostable alternatives and reusables - largely without success.

Dunkin' Donuts once told Bloomberg it took nine years to figure out an alternative to its signature foam cup. Prototypes using recycled material leaked easily, while biodegradable fibres proved prohibitively expensive to scale at volume.

Back in 1997, Starbucks CEO Howard Schultz called the question of the cup "one of the most nagging issues we've dealt with" - a brainteaser that "seemed to pit our values against our brand image and our desire for customer service." After several years of trying, and failing, to engineer a better cup, Starbucks launched a \$10-million grant challenge in 2018 to solicit ideas from the public, though it has not yet produced an alternative.

ButterflyCup's innovation helps fill a gap, says Susan Senecal, the CEO of A&W Canada who has spurred numerous sustainability initiatives since ascending the C-suite in 2018.

"Most of our throwaway cups can't be processed by recyclers because of the plastic coating. We wanted something compostable," she told the Star.

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Lu's design is made from natural paper sourced from forests certified as sustainable by the German-based Forest Stewardship Council. Even if improperly disposed of as litter, the cup biodegrades naturally like raw paper, according to ButterflyCup. That makes it an improvement over the plastic packaging quick-service restaurants have historically embraced for the sake of customer convenience and profit.

The profit angle for plastics is simple. According to data from the plastics industry, a plastic grocery bag costs three cents to produce while a compostable bag typically costs a dime - a 233 per cent increase.

Consumers, for their part, have long embraced the convenience of throwaway cups and not always welcomed eco-minded innovations. A few years ago, when some food chains pivoted to paper straws, customers complained that the product disintegrated in their mouth, making it harder to sip the drink.

The plastics industry also has a decades-long head start on production. The infrastructure needed to produce biodegradable products is largely underdeveloped, leaving startups like ButterflyCup not only to design the packaging but also the machinery needed to mass-produce the packaging.

Senecal acknowledges that finding sustainable alternatives has been tough. "Takeout has always been a bit of a puzzle for us. You want something that doesn't leak and that customers find easy to hold and drink from," she said. The challenge is finding an alternative that can be produced at mass scale like plastics.

Paper cups date back to imperial China, where paper was invented in the second century BC. But the plastic lining grew popular in the West amid the Industrial Revolution, when Americans began contracting tuberculosis and pneumonia from the communal drinking cups stationed at public water fountains and shared among thirsty passersby.

Lawrence Luellen, a Massachusetts lawyer and teetotaler, introduced the first wax-lined disposable cup in 1907, labelling it the Health Kup. At the time, it was seen as a triumph for public health. And soon enough, Luellen's Dixie Cup Company was mass producing plastic-lined cups for nascent fast-food chains like McDonald's, who folded the product into their takeaway meal offerings.

Today, companies like Huhtamaki and International Paper lead a booming disposable-cup industry. In 2021, the market for plastic cups reached \$17 billion (Canadian). In 2028, it is expected to grow to \$26.6 billion.

But the business of plastics is a nightmare for the environment. In 2019, the World Wildlife Fund estimated that plastic pollution entering oceans will triple to 29 million tonnes by 2040, while greenhouse gas emissions from plastics will account for up to 20 per cent of the entire global carbon budget.

Recycling has proven to be an inadequate solution. For-profit recyclers, worried that plastic-lined cups will hurt their machines, are reluctant to mix paper cups with other recycled products. So most paper cups wind up in the trash, where the plastic lining, thin as it is, keeps them from decomposing quickly.

"Recovery facilities function as a business, not a non-profit, so they don't want contaminated materials they can't make money off. They're looking for clean, well-sorted types of plastics, glass and paper they can resell easily," said Kate Daly, managing director of Closed Loop Partners, a recycling-focused investment firm in New York.

After carefully researching the structural integrity of plastic-lined cups, Lu approached McLoughlin with a handmade prototype of his biodegradable alternative in 2009. The device, constructed entirely with thick, biodegradable cardboard, abandoned the need for lids or lining.

"When the flaps close, the curvature on them allows the lower flap to press upwards and the higher flap to press downwards, creating a countervailing pressure that forms a seal between the two spouts," McLoughlin explains.

To put it simply, the user creates the lid by making two simple folds at the top after the drink is poured.

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The cup went through thousands of iterations of design in subsequent years - the project kept afloat by angel investors - until finally, just before the pandemic hit, they found two manufacturers in Asia willing to produce their cups en masse.

European companies were the first to notice the ButterflyCup, followed by a few firms in East Asia, McLoughlin said. Eventually, the company was forging relationships with popular food vendors in Japan, Hong Kong and Australia.

North America, meanwhile, was tough to crack. Food chains have few business incentives to pivot away from plastics, McLoughlin said, and convincing them hasn't been easy.

That might be changing. Over the past decade, demand for sustainable products has skyrocketed among consumers as climate scientists and governments issue increasingly stark warnings about the consequences of our consumption habits.

Municipalities across North America have cracked down on single-use plastic packaging. The City of Vancouver recently instituted a ban on plastic and compostable plastic shopping bags, along with a 25-cent minimum fee for each single-use cup. Toronto's climate action strategy aims to divert 95 per cent of waste from landfill by 2050.

A&W Canada, which opened in Canada in 1956 as a spinoff of the American chain, has sought to harness the changing mood. In 2013, not long after Susan Senecal came in as chief marketing officer, the company trialled hormone- and steroid-free beef. Soon after, it introduced antibiotic-free chicken and pork.

Over the next six years, the company embraced fair trade coffee, eliminated processed cheese and sourced eggs from hens with vegetarian feed. It adopted paper straws in 2019 - keeping 82 million plastic straws out of landfills annually, according to its own metrics - and turned its last 140,000 plastic straws into a 35" art installation outside Union Station titled "Change is Good."

When the company piloted the Beyond Meat burger in 2018, marking the first plant-based burger in North America from a fast-food chain, the initial release was so successful that A&W ran out of patties and suspended sales for a month before launching the product again. The company did its market research, Senecal said; it spent three years sampling plant-based products at the A&W Innovation Centre in British Columbia before settling on Beyond Meat.

"It's what our customers want," said Senecal.

All the while, the company has seen impressive growth. Same-store sales jumped 9.8 per cent the year the Beyond Meat burger was introduced. In October, as COVID-19 public health restrictions were lifted on restaurants, the company reported sales growth of nearly 17 per cent and revenue totalling \$409.5 million for the quarter, up from \$340.6 million a year earlier.

According to Foodservice and Hospitality Magazine, A&W now trails only McDonald's in Canadian market share.

But when it comes to the environment, the company, like most food chains, still has a long way to go, environmental advocates say. Compostable as they are, even fully biodegradable cups contribute to our use-it-once, throw-it-away culture, said Sarah King, head of Greenpeace Canada's Oceans & Plastics campaign.

"We see these initiatives as routinely missing the mark. Companies promoting single-use cups should really be looking at reusable alternatives at every possible opportunity," said King.

The concerns King raises are pragmatic. The "Zero Cup" pilot project, which begins Monday, exists on a miniature scale. In a country with 971 A&W locations, the initiative is confined to Toronto's 44 outlets, and the biodegradable cups are reserved strictly for hot beverages. The classic A&W Root Beer - and every other soda the chain sells - is still consumed from a plastic cup.

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Scaling the pilot project will be difficult given Canada's patchwork composting system, said King, who has spent more than a decade doing plastic-elimination advocacy for Greenpeace. "Not every town has a green-bin program. Outside of Toronto, especially, there isn't always a composting facility available to collect eco-friendly disposable cups. So if I live in a town where the facility doesn't exist, what's the point of having a biodegradable cup?" said King.

Some food chains have experimented with reusable options, but that comes with pitfalls of its own, said Closed Loop Partners' Daly. "How do you motivate people to use reusable cups when it's often easier to buy a new one? Where do bins need to be placed in a restaurant to increase the likelihood someone will drop off the cup when they're done? How do you ensure each location has washing facilities to manage all those cups?"

Last September, A&W Canada launched a reusable mug program at 20 locations in Vancouver, where its headquarters are based. Members pay \$3 to join the company's "Cup Crew" program, and receive a 20-cent discount each time they trade in their shareable cup to purchase another drink in a reusable cup. The cups are cleaned and sanitized using what Senecal describes as "super high temperatures" in A&W's commercial dishwashers.

After a pandemic pause, Starbucks locations in Canada and the U.S. adopted a similar program, accepting customers' reusable cups with a 10-cent discount on drinks.

To eliminate waste, King says this is the way to go. "When we're talking about truly circular or zero-waste options, we need to be thinking about things we can be using over and over again," she said.

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